THE OPTICAL MAGIC LANTERN JOURNAL AND PHOTOGRAPHIC ENLARGER.

EDITED BY J. HAY TAYLOR.

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Notices.

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Important Notice!!!

We have much pleasure in informing our numerous readers that we have removed to our new offices at

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"Optical Magic Lantern Journal,"
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Notes.

Dr. John Nicol, for many years editor of the *Photo Beacon* (Chicago), has assumed the editorial chair of the *Photo American*, Mr. F. C. Beach, the late editor, having retired.

* * *

The Hon. Slingsby Bethell, reading clerk to the House of Lords, died at Brighton on 3rd ult. Mr. Bethell was an ardent lanternist, and for some time president of the Lantern Society.

* * *

Acetylene is being tried as an illuminant on the Paris tramcars, the generator being placed on the rear platform underneath the steps. Though its weight when charged is only 27 pounds, it is capable of producing 35 cubic feet of the gas, the illuminating power of which is estimated at fifteen times that of ordinary coal gas. The lighting is said to be very efficient. The cost, it is said, works out at less than that of lighting by petroleum.

* * *

NEAR the St. James' Railway Station a pavement artist has lately taken his stand. Some of his chief works of art consist of pictures in blue and white chalk, which are labelled "Studies in ferro-prussiate."

* * *

EXPERIMENTS are being conducted by Brin's Oxygen Company with a view to ascertain the commercial aspect of supplying oxygen compressed to liquid.

* * *

MESSRS. WOOD BROS., of 73, Lord Street, Liverpool, have taken over the novelties introduced by Mr. Wormald, of Sutton. These consist of the "Wormald" slide masks, binders, white ink, anti-halation paper, developers, dead black, etc.

* * *

THE Chief Khama when in England purchased a lantern outfit, and has recently caused a sensation at Palapye by giving an exhibition to 4,000 natives.

* * *

MR. MATTHEWS, inventor of the portable optical lantern, has taken charge of the office of the Scientific Hand Camera Co., at 97, Queen Victoria Street, E.C., where he will be most willing to show the scientific hand camera.

——:o:——

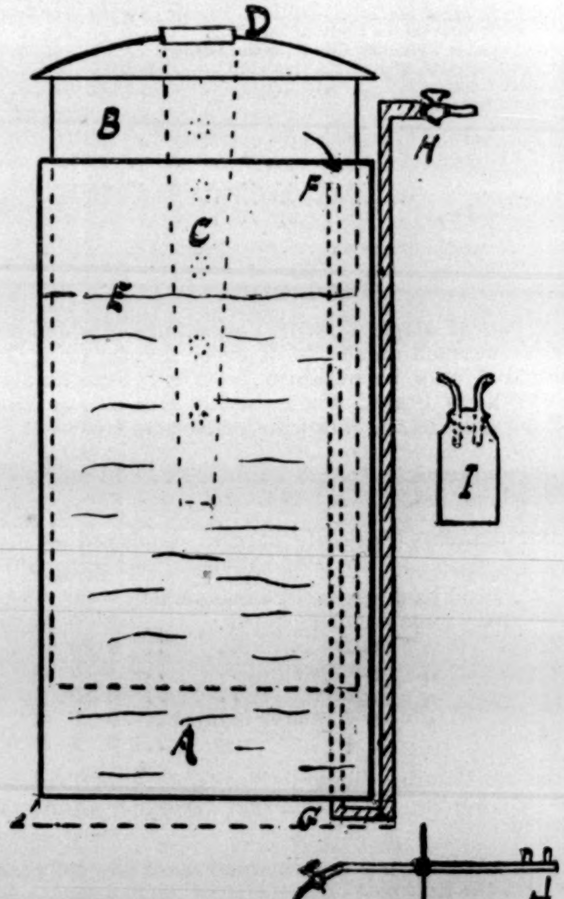
Acetylene Gas for the Lantern.

WITHOUT doubt acetylene gas will shortly supercede even the best oil lamp for the lantern, but of course this will take some little time; however, as soon as it becomes an easy matter to obtain calcium carbide in villages, or even small towns, this event will be brought about.

The light obtainable from this gas is preferable to the best lantern lamp which we have tried, and added to this, entire freedom of smell when burning, and the fact that no attention to the light is required, one has merely to try it once to ascertain its great advantages.

A generator and burner can be made very cheaply, and to this end Messrs. Thorn & Co., of 169, Camberwell New Road, S.E., have introduced one called the "Incanto Acetylene Gas Generator," and it is questionable whether one could make a single one as cheap as supplied by this firm.

With the instructions sent out it is stated that a charge of one pound of calcium carbide will last two and a half hours, but with the burner sent out by this firm, according to our experience a half-pound will only last a little less than one hour, but this depends on the quality of the calcium carbide. The burner, or more correctly speaking burners, for there are two, consist of two of Bray's No. 0000, the one next the condenser being placed flat with it, whilst at the distance of 1 in. behind is another, the flame from which is presented at right angles to the first.



The apparatus consists of a gasometer 17 in. high, with a diameter of 8 in. The lower tank (A) is of course filled with water, and upon this the tank portion (B) floats. At the top of (B) is a circular hole whereby to introduce a supply of calcium carbide. This is placed in a receiver (C) consisting of a cone with perforations at the sides, and the hole is then made gas tight with a trap lid at top (D). This having been done and (B) floated on the water, it becomes necessary to get rid of the air in same before it will sink deep enough to allow the water to flow into (C), and it will be seen that if the stopcock (H) is opened the air will pass down the standpipe (E) and reach (H) *via* the bend (G). As soon as the container (C) reaches the water acetylene gas is at once generated, and the floating portion (B) rises, and as soon as sufficient air is expelled it may be ignited at the burner, connection being made between same and (H) by means of rubber-tubing. In Messrs. Thorn's apparatus an improvement might be made in the standpipe (E), as it is of very small diameter; quite sufficient it is true to carry off the gas easily, but as the bend (G) is also small and is not provided with a cock, certain moisture which is generated collects here, and after about half-an-hour's use the gas bubbles through and the light at the burner in consequence assumes a jerky action.

In order to obviate all chance of this, we think it would be an improvement to bring the outlet pipe direct from the top of (B), or else to make the tubing at the bend (G) of sufficiently large diameter so that notwithstanding the collection of a few drops of watery matter here, there would still be a clear passage-way for the gas. If the tubing were brought from the top of (B) it might be contended that the moisture would congregate in the bite of the tubing, but this could easily be overcome by having a small bottle provided with a cork into which is fitted two tubes as at (I), but these are minor details which are easily overcome.

It will be observed that as soon as gas is generated, the container is lifted out of the water by reason of the gas in (B), and as soon as this has been exhausted sufficiently for (B) to sink a certain distance, the container will again reach the water and more gas be generated, which again lifts it away from the water, and this rising and falling is continued until no more gas can be obtained from the supply of calcium carbide with which the container was charged.

Since the above was in type and the sketch made, an amendment has been made in the apparatus, and Messrs. Thorn & Co. have sent us a second generator, which is an improvement on the first, inasmuch as they have now added a water trap at (G) fitted with a tap, which entirely prevents the jumping of the flame to which we alluded in connection with the above sketch; but we have pleasure in stating that the apparatus as now made works with perfect smoothness. In the cut of the new form, it will be seen that the outlet tap is not carried quite so high as in the former pattern.

——:o:——

Some Practical Hints on the Röntgen X Rays.

By X.

THE great interest that has been evinced by all classes of the community in the effects that have been produced with the X rays, has caused the subject to occupy a prominent position in the scientific world. The medical faculty and press, always tardy in recognising a new departure, have entered enthusiastically into the consideration and actual practice of the work, and many amateur photograpers have possessed themselves of the needful apparatus with the view of experimenting for themselves. The amateur is a *force majeure* in nearly all scientific pursuits, and it will be conceded that progress is more often attributable to his efforts than to those of the professional. It therefore augurs well for this new development of science, that many of our best amateur photographers are interesting themselves in it, and at no very remote period, we may in consequence, look for considerable progress in methods of procedure, and a better understanding of the principles involved.

I here propose to give some hints to my readers—the outcome of considerable practical experience—which will enable them to start, or to pursue, experiments under the most favourable circumstances.

There are always to be found people who are anxious to describe in print the effects that they have obtained with the most out of the way and meagre appliances; they remind one of the farmer, who, with a view to ascertaining how little his horse could live upon, gradually reduced the quantity of its food, until it consisted of but one oat a day, and then the poor beast died. My aim will not be in this direction, although the economical aspect has not been absent from my mind in the advice that is given, but rather to state distinctly the necessities for accomplishing the work in an efficient manner.

There are three essential instruments for the purpose:—An induction coil, a battery, and a vacuum tube.

The Induction Coil.—It has been stated on several occasions that effects have been produced with a coil giving only a 2 inch spark, but on enquiry it has usually been found that it was a coil capable of producing a longer spark, but worked at an estimated lower length of spark. To excite a suitably exhausted tube thoroughly well, a 3 inch spark is needful, but it is invariably recommended that a coil should not be continuously worked at its greatest power. If a coil giving a 3 inch spark be used, it must be run at full tension, or the tube will be but poorly excited and the exposure considerably lengthened. It will, therefore, be found advisable to have say a 4 inch spark coil, and run it at 3 inches. Many workers are using coils giving a 6 inch or even larger spark, and these work in a considerably more uniform manner at the tension necessary for illuminating the tube than those of smaller size. It will be found advantageous, if the coil is to be used frequently, to be provided with a duplicate set of platinum contact points for the coil.

The Battery.—The simplest arrangement consists of Bunsen's or Grove's cells, one cell to each inch of spark yielded by the coil; thus, a 4 inch spark coil would need four cells. The trouble of re-charging such a battery is, however, very considerable for other than occasional work, and accumulators will be found far more useful for continuous work. They are supplied to run for a great number of hours, and can be re-charged at any works where a dynamo is employed at a very small cost.

The Vacuum Tube.—Practically, everything depends on the suitability and efficiency of the tube. The form that was devised by Mr. Jackson, of King's College, and is obtainable from a large number of dealers, is unquestionably the best. Many workers are possessed of this form of tube, but are still unsuccessful in obtaining good results. The fault more often than not rests with the tube, and not with the worker. As a matter of fact, an enormous number of tubes are being sent out which will never do more than produce a shadow effect, and it would be well if all disappointed workers were to make for themselves, or to purchase a fluorescent screen, such as those referred to below, and to test their tubes therewith. There is a difference of opinion amongst workers as to the distance at which the tube should be used from the subject; but it would appear to be pretty generally agreed that 9 to 10 inches is the most suitable. The platinum disc should be as nearly as possible parallel with the subject.

"What is the life of a tube?" is a question that is frequently asked. With care there is no reason why it should not last for a lengthy period. Mr. Godfrey Martyn, who was exhibiting at the Crystal Palace, informed me that he had used two of Watson & Sons' "Reliable" tubes for all his exhibits, which were hourly, for nearly a fortnight without any deterioration whatever, and he is still employing them. Tubes in which the platinum disc gets red hot within a minute of the tube being excited, should be treated with suspicion. They invariably go wrong after very little use. Care should be taken when fitting up the apparatus that the communicating wires do not touch the glass of the tube. If they are allowed to do so it will almost surely result in irretrievable damage to the tube. If manufacturers could see their way to strengthening the platinum contact ends, to which the wires from the coil are attached, they would earn the thanks of all users of these tubes.

Fluorescent Screen.—A large number of materials have been tried with a view to producing these at a low price, but so far with a very small measure of success. It is somewhat unfortunate that the most effective should be made of platino-cyanide of potassium, the cost of which is about 8s. per drachm.

The method of preparation recommended is to coat a thin plate of black celluloid with gum, and allow it to nearly dry; powder the potassium very finely and mix it up in a thick paste with gum. This should then be painted on the gummed space on the celluloid, allowing sufficient time between each coat for drying. The fluorescence is increased according to the amount of potassium that is used.

Two firms are supplying these screens commercially, namely Newton & Son, and W. Watson & Sons. I have worked with these screens and found they produced very luminous effects, rendering visible a coin in the middle of a thick book or through a three inch block of wood, the bones of the foot in a boot, etc. Apart from the advantages of the fluorescent screen for enabling bones of the body, etc., to be seen, it is of importance for testing tubes. If the tube produces no luminous effect on the fluorescent screen—and I have met with many that do not—it is entirely useless for producing negatives, and in proportion to the luminous effect will be the efficacy of the tube for yielding results and shortening exposure.

Every worker should provide himself with a fluorescent screen for this if for no other purpose.

The fluorescent screen cannot yet be considered as perfect, and until either a material composed of a very luminous substance is discovered, or the tube can be made to yield a brighter effect, it cannot be considered sufficiently perfect for diagnostic purposes.

The Tube Holder.—Though but a detail in the equipment, it is by no means to be despised. It should permit of a tube being placed in any position, have a good large base for carrying a dry plate and for placing the subject upon.

Almost daily fresh details are being introduced for perfecting the process of working with the X rays, and it is confidently expected that very shortly the exposure necessary will be reduced to a few seconds, and it has even been whispered that a certain dry plate maker on the continent has succeeded in making a special plate for the purpose, that enables an effect to be obtained with an exposure of one-tenth of a second.

——:o:——

Oxygen, Its Manufacture, Storage, and Use.—III.

By Edmund H. Wilkie

(*Of the Late Royal Polytechnic Institution*).

A machine for generating oxygen at the time of consumption of a really automatic character has lately been patented by Mr Stedman (of Soper & Stedman).

It is very simple in construction—in fact, after looking at the apparatus as a whole, one cannot help thinking, "Why did we not invent this long ago?" Roughly speaking, it consists of a series of small retorts coupled together, and a gas holder; but there are many small details which, although simple in themselves, are of the greatest importance to its perfect working. These I shall notice as we go along. The general appearance of the apparatus when waiting to commence work is represented at Fig. VI., where will be seen the four retorts in a line connected by the brass tube (A). Each retort consists of two parts, a circular body 2¾ inches in diameter by 1½ inches deep, with a flat bottom and a dome top which is fastened on to the body by the screw clamp shown in the diagram. On the top of each cover is a small square block, through which passes the brass tube (A), which, being perforated at its lower side through to the interior of the retort, connects the four retorts as one. This connecting tube bends downwards at the end to the purifier, which is of the ordinary form, and is connected to it by means of a few inches of flexible tubing; but just before entering the purifier, the gas passes through a back-pressure valve, which prevents the water in the purifier being forced into the retorts by the pressure of the gas in the container. After being cooled and purified, the gas is collected in a small india-rubber gas bag, and the pressure is applied by a board in the ordinary manner, the weight consisting of two metal cases partially filled with water. I am informed by Mr. Stedman that the pressure at the jet from this apparatus is about 6 inches of water.

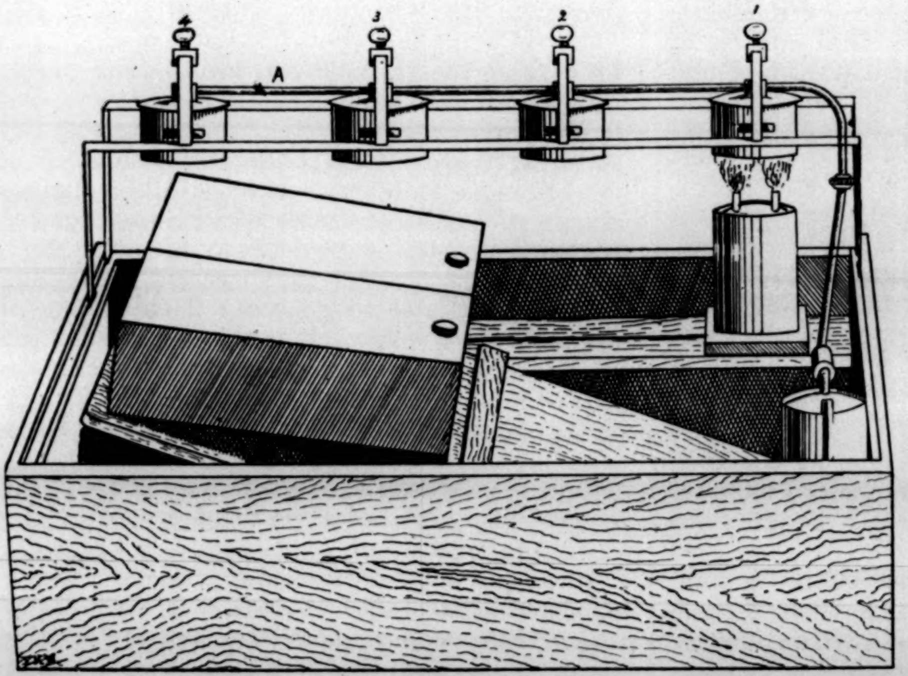
So far I have not touched upon the vital principle of the apparatus—the really automatic portion of it.

It will be noticed that the charge of chemicals for making the gas is divided into four parts; by that I mean that it occupies four retorts, and it is apparent that some mechanism is necessary to bring these retorts under the influence of heat in order to generate the gas. The charges consist of small flat cakes, which when placed within the retorts leave a space of nearly half-an-inch all round, each cake containing sufficient material to generate 2 cubic feet of oxygen. Two cubic feet is the capacity of the gas holder, so it will be apparent that when the first charge is exhausted, it is necessary for the operation of gas making to be suspended for a time, in order that some of the gas already stored may be used to make room for the next supply; and herein lies the whole secret of the automatic apparatus.

In all previous schemes for making oxygen from small charges for immediate consumption, which have come under the notice of the writer, it has been the invariable rule to shift the retort and bring a fresh one into its place, or to introduce another charge; but in the apparatus under consideration a new departure has been made. The retorts retain their original position, but the source of heat, which is a spirit lamp having four wicks, travels along, heating them in succession. We will suppose the first retort has generated the 2 feet of oxygen contained in its charge and the holder is full. It may remain in this condition for a considerable length of time. There is no necessity to use the gas at a given rate of speed, as no more will be generated until the first supply is partially exhausted.

We will now light up the lantern, and presently when about two-thirds of the oxygen has been consumed, the pressure board in descending presses a lever, liberating the lamp which is drawn along by a spring until it is directly under retort No. 2, when it is stopped by a peg which keeps it in its place until it is time for it to go on its travels once more.

The charge in the second retort then commences to develop gas, and if by any chance more should be generated than can be held by the container an outlet is provided in the form of a tap, which is automatically turned on, and which kindly shuts itself off with the aid of a spring the moment the extra pressure is relieved. The apparatus works without attention for one and a-half hours with a single lantern, but if a triple lantern is being worked, or if from any cause a larger supply of oxygen is required, two sets of retorts are used in which case all that is necessary is to lift off the first four in one block at the end of the first hour, and replace by another set. This is done in a moment, as there are no fixtures to arrange or fasten with the exception of slipping off and on, the end of the flexible connection to the purifier.



The lanterns may be burning during the time of changing the retorts, as the gas cannot return when the retorts are disconnected, being retained by the back-pressure valve previously mentioned, and it will be seen that the operation of changing could be continued indefinitely.

When working with gas bags and pressure boards, more particularly double boards which contain the two bags under one set of weights, it will be remembered that in order to keep the pressure equal it is necessary to add an additional $\frac{1}{4}$ cwt. when the bags have discharged about one-third of their contents, and in order to overcome this difficulty Mr. Stedman has taken advantage of the law of Nature, that "water always finds it own level." On referring to the diagram of the apparatus, we notice that this pressure is obtained from two oblong tanks, placed on the top of the pressure board. These contain water (about 12 lbs. weight in each), but are only partially filled, and the secret of their working lies in the fact that they are not placed flat upon the surface of the board, the end nearest to the screw cap for filling being raised on a block several inches in height.

As a result, the bottoms of the tanks and the top of the pressure board do not lie in the same plane.

When the gas container is full, the extreme end of the board is of course elevated at a considerable angle, and, as a natural consequence, the water flows towards the centre of the board, lessening the leverage, as a portion of the weight is shifted to the centre, but as the board descends, the water gravitates towards the extreme end, and if the major portion of the gas be drawn from the bag, the tanks become heavier at the extreme end and thus keep the pressure equal. The full size of the original model when closed is 28 inches long, 15 inches wide, and 9 inches deep, but I believe that in consequence of some modifications in the original scheme, a reduction in size is contemplated.

This apparatus is made in two forms, and the second form, which is perhaps the better one, will be commented upon in my next chapter.

——:o:——

Platinotype Printing.

The patent rights in respect to making platinotype paper having expired, Mr. T. Mitchell at a recent meeting of the Darwen Photographic Society gave the formulæ for its preparation for the benefit of those who desired to prepare their own.

No. 1.

Ferric Oxalate	600 grs.
Distilled Water	5 ozs.
Oxalic Acid	40 grs.

No. 2.

Chloro-Platinite Potassium ..	400 grs.
Distilled-Water	5 ozs.

of No. 1 Solution take 22 drs.
No. 2 „ „ 24 drs.
Water „ 4 drs.

The paper after being sized according to the tint required (*i.e.*, gelatine for bluish black, and starch or arrowroot for brownish), is floated face downwards in the above solution for not more than three minutes, then dried in about 100 degrees Fahr., care being taken not to exceed this temperature, otherwise fogged prints will be the result.

He placed frames about 6 inches from the flame of the Platinotype Company's lamp until the magnesium was burnt away, after which he showed the method of development, using the salts as sold by the company on account of them producing better half-tones, urging the importance of having the developer at a minimum temperature of 60, and a maximum of 100 degrees Fahr. On account of the vigorous action of the developer, attention was drawn to the manner of development, which was better done by taking hold of the paper at each end, and drawing it face downwards through the solution once ; this was to prevent the adhesion of air bubbles on the picture, and to be more certain of damping the whole surface without leaving dry patches, as the action of the developer is so rapid that by the time the defects were noticeable it is very often too late to rectify. In addition to this it allows a little more time to examine, and with three immersions the picture is generally about developed. After this the prints are transferred to three baths of hydrochloric acid and water 1 to 60, and allowed to remain five, ten and ten minutes respectively, then washed for about twenty minutes in running water. The whole operation of printing, clearing and washing is completed in much under an hour.

The use of *pure* hydrochloric acid during the clearing process was strongly advocated and the rejection of the third bath immediately it assumed the least trace of yellowness, this being essential if permanent prints are to be the result. By making the following solution slightly alkaline, warm tones might be produced. Potash, soda, or the carbonate of these alkalies may be used, but on no account in larger quantities than just sufficient to turn red litmus paper black (ammonia is unsuitable).

Oxalate of Potash Solution, normal strength, *i.e.*, 1 lb. of Oxalate dissolved in 54 ozs. of water ..	1 part.
Water	2 parts.

—:o:—

Stereoscopic Effects on the Lantern Screen.

WHAT HAS BEEN DONE AND WHAT MAY BE DONE.—No. III.

By Thomas Bolas, F.C.S., F.I.C.

(*Continued from page* 66.)

As supplementary to my list of some of the numerous efforts to revive interest in the Blanchère-D'Almeida method of stereoscopic projection in complementary colours, I should mention Mr. T. E. Freshwater's very interesting demonstration at a meeting of the Royal Photographic Society, only a few weeks ago, and his paper in the March issue of the journal of the society (1896, p. 189), Mr. Freshwater mentioned that he had thought out the system independently of others, but in his paper he gives full credit to the pioneers in this work. The demonstration, which was commenced by the projection of a geometrical subject to illlustrate the principle, showed how easy it is for a lanternist to introduce a feature in his exhibition which should be novel to the greater number of his spectators ; and Messrs. Newton now supply an assortment of stereoscopic subjects, each a pair of slides backed with red and green glass of suitable tints. They also keep in stock coloured spectacles for viewing the double image on the screen.

The account of Clandet's steromonoscope in my previous article is sufficient to show that this eminent authority did not, as often asserted, fall into the common error of stating that the effect of solidity can be obtained by the mere superimposition of the two halves of a stereoscopic subject upon the same sheet, or upon the same screen, but scarcely a year has passed during the last thirty years without this notion being put forward seriously. As one example it may be mentioned that in 1865 Mr. E. Pettitt set forth this view, and on June 13th in that year he read a paper on the subject before the South London Photographic Society ; this paper being published in the *Photographic News* for 1865, p. 295. Mr. Pettitt thus speaks of his "binographs," which he appears to have made on paper and on glass.

The lines of the various perspectives, due to the angle at which each picture is taken, falling upon each other and coalescing, round off and soften each other, supplying those tender gradations of light and shade which make a finished picture, instead of a coarse, hard outlined sketch which the single lens, however good, must always produce in life-sized pictures. So far he may perhaps have some reason on his side, but not in assuming stereoscopic properties.

In refuting this notion that the mere superimposing of the unlike halves of the stereoscopic slide can give a true stereoscopic effect, Mr. Thomas Sutton ("Sutton's Notes," 1865, p. 201) describes an experiment of very special interest as bearing on Dove's stereoscopic method of detecting forgery or reprint (W. H. Dove, *Journal of the Photographic Society*, May 23rd, 1859, p. 297 ; and *The Photogram*, March, 1896, p. 60). Indeed, the following simple experiment, described by Sutton, is of so much interest as to be well worth repeating, and it is curious to note that some persons who fail to consciously see one of the dots as at a great distance, perceive what is really an unconscious deduction from the phenomenon ; they see that dot which appears distant as much larger than the other. Obviously the quasi-distant dot only appears larger because it is seen as at a distance, while its actual size is the same as the other. Mr. Sutton says:—"The idea that if two stereoscopic views of an object, taken from distant stations, be superimposed, and viewed together with both eyes, a truthful stereoscopic or natural effect will be produced, is, we believe, erroneous. In proof let us discuss the case of the simplest of pictures, two black dots. Take a stereoscopic card and draw a horizontal straight line across it. On the left put two black dots anywhere on this line ; call them A B. On the right side, and on the same line, put two other black dots *a b*. Let the distance from A to *a* be 2½ inches, and from B to *b* 2⅜ inches. Now place the card in a stereoscopic, fitted with whole lenses 2½ inches from centre to centre. The dots *a b*, being viewed by the right eye, and A B by the left eye, the four will appear as two, but A and *a* will resolve themselves into one apparently at an infinite distance, because the optic axes will then be parallel ; while B and *b* will resolve themselves into one apparently much nearer, because the optic axes will then meet at no great distance behind the card.

Let us try another experiment with all in only one picture, and superimpose the dot *a* upon A, leaving the dot *b* to fall ⅛th of an inch distant from B : then look at the three dots, A, *b*, B, with both eyes directed at the card.

We shall of course see the three dots and not two as in the stereoscope. The left eye will have no power of seeing only A and B, while it ignores the presence of *b* ; nor will the right eye have the power of seeing only A and *b*, while it ignores the presence of B.

Another form of the error as to mere superimposition of images on the same surface producing stereoscopic effect, is an assumption that the alternate projection of the two elements of the stereogram will produce stereoscopic effect, if the alternations follow one another rapidly enough to give continuity of vision, an error which Mr. W. B. Woodbury corrects in Liesegang's *Latena Magica* for 1884, p. 21. "Indeed," says Mr. Woodbury, "if this were so a one-eyed person might see stereoscopically." The notion, however, appears again in the *British Journal of Photography* for this year, p. 63, where Mr. W. Mathews contends that if the images are projected alternately on the screen in complementary colours, the spectators will be able to see stereoscopically without discriminating spectacles. The method of alternately projecting the two images, and allowing the spectators to look through two openings which alternately close was, as stated in my first article (p. 24), suggested by D'Almeida in 1858 ; but it was not until in 1886 that Mr. A. Stroh exhibited, before the Royal Society, a device by which the two pictures of the stereogram could be alternately projected on a screen so rapidly as to be within the time of continuity of vision, and they are viewed through eye-holes which are covered alternately, this covering and uncovering keeping time with the alternations of the projection. The device used by Mr. Stroh consists of two optical lanterns placed side by side, and the stereoscopic pair of transparencies are set one in each lantern ; these being then adjusted so that the images shall overlap on the same screen as nearly as possible, a large framework is fixed in front of the two lanterns, this extending some distance on each side. Set upon this framework, and covering the object glasses of the lantern, is a revolving disc, portions of which are cut away, so that in revolving it obscures the light of each lantern alternately ; one picture only of the stereogram being on the screen at the same time. The framework also carries at its extreme ends and conveniently placed for observers the observing apparatus before mentioned.

At each end of the framework is a pair of eyeholes, and behind each pair is a revolving disc, with a sector cut out, these discs being connected by suitable gearing with the disc which works in front of the projection lenses. The connection of the discs must obviously be such that the view through the hole in front of the right eye shall be unobscured when the picture for the right eye is on the screen, and *vice versa*.

To make this method available for a considerable number of spectators a number of synchronic shutters would have to be provided, these being mounted, say, one in front of each seat. The driving power for these might very well be electricity or impulses of compressed air. In the former case the exact device most suitable would probably be a Siemens' polarised electro magnet, such as was used in the receiver of Siemens and Halske's A B C telegraph instruments. The oscillating tongue of iron, hinged to the unwound or permanently magnetic pole of the system, and playing between the wound bifurcations of soft iron, might easily carry a light shutter alternately obscuring the eye holes, and all the observing devices would be driven synchronously by alternating electric impulses, controlled by the disc rotating in front of the projection lenses. A delicate construction of the receiver would be required to operate with sufficient rapidity, and such receivers would necessarily be somewhat expensive. For seats placed in rows light strips of cardboard, suitably perforated, might be driven mechanically, each strip controlling the observation holes for a row of seats.

(*To be continued.*)

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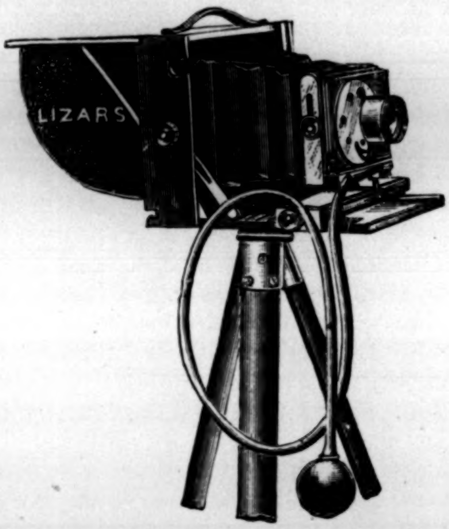
Hand Cameras for obtaining Slides for the Lantern. "No. 35 Challenge."

THE challenge ¼-plate camera introduced by Mr. J. Lizars is a neat, strong, small and desirable one. When closed it measures 6 in. by 5 by 2½ in. (without dark slides). It is provided with three double dark slides either of book or block form.

To set up or open the camera for use, the base board is folded down from the front, clamped, (it serving when closed as a protection to the lens) and the front which carries a Thornton-Pickard shutter to which the lens is attached, secured by means of bayonet joints to the runner. This runner passes over a graduated scale showing when the lens is in focus for given distances.

The lens on the camera which we have tried was one by Taylor, Taylor & Hobson. These lenses require no comment on our part.

As shown in the cut, the ground glass has a protection shield, which when opened and held up by a strut for the purpose, dispenses with the use of a focussing cloth.



A finder is so arranged that it can be made applicable for either vertical or horizontal pictures. The bellows is made of three thicknesses, the outer one being of a good quality of leather, and two bosses are let into the camera for securing it to a stand when desired.

For use with horizontal pictures the swing back and rising front can be brought into play.

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Wild Lantern Experiences.

BY W. H. MATHIESON, Invercargill, New Zealand.

As the editor did me the honour some months back to kindly refer to me as a successful lantern lecturer, I send some notes of a rather trying time I had while travelling round the gold-fields in Otago, New Zealand, last year. It will give the readers some idea of how lantern lecturers get on in the antipodes—at any rate.

The gold diggers are a rough-and-ready lot. All classes of society are to be found congregating there. Many younger sons of the finest families in the land are there as well as the off-scourings of the earth, the flotsam and jetsam of humanity. They are remarkable for their generous hospitality, which is freely bestowed on the poor and destitute. On the other hand, hurt their feelings—or as an Irishman would say, "tread on the tail of their coat"—and they will go to any extremes to wreck vengeance on you.

On one of the principal digging townships last year, I arrived at my advertised time to give my lecture. The night before I drove fourteen miles after my performance—no railways in this country, which is very rough—and got to a comfortable hotel at one o'clock in the morning; that morning was up at six o'clock, drove thirty miles to keep my appointment, and arrived at two o'clock on a hot summer afternoon. At the Post Office one of the clerks kindly informed me, as I was getting my letters, that there had been two rival shows the night before in the town. Three men had hired a small hall, and had given a magic lantern show. Their audience consisted of nine small children at sixpence each. The entire plant, lantern and pictures, would be dear at £5. They left very early, forgetting in their hurry to pay their hotel bill, or the rent of the hall. At the Town Hall they had what we would call a free show, a collection being made to pay for the rent of the hall, this was given by a gentleman who was lecturing on temperance. He was gifted with a very fluent delivery; was remarkably stout, and, strange as it may appear, from his florid complexion bore a remarkable resemblance to a successful Boniface, the man of all others he was supposed to hate. Unfortunately for the cause, he was exceedingly sarcastic, so much so that in every town he had been lecturing he had set the people by the ears, and I had heard this as I was three days behind him; but as he was under the patronage of the local temperance societies, and stayed with the clergyman, he had got safely away. Well, this gentleman had his hall half-full and was in the midst of his lecture, and showing how the publicans were the most degraded of humanity, etc., when the mayor and the local medico not liking his remarks, got up and were in the act of leaving, when the lecturer turned to them, and pointing, said "There goes two brewers' travellers, I knew I was too hot for them." The mayor turned round and said "I beg your pardon, did you refer to me?" One word brought on another, and the mayor, who was a hot-tempered man, challenged the lecturer to come outside. This suited the rowdy element immensely, and they became noisy. He turned his attention to them and gave them a bit of his mind. They retorted by rushing on the stage, and a free fight ensued, and the lecturer was roughly handled. His silk hat—we call them "bell-toppers" here—got smashed, and the local clergyman, whose guest he was, got him out at the stage door. The mob chased him to the manse door, and if he had been in any other house in the town would have hauled him out and ducked him. As it was they went to the stable, took away his horse (a hired one), and it was "planted" for over a fortnight, although there was a reward of £10 for its recovery.

This was not a very pleasant prospect for me. By the time I had made all arrangements, and had a practice with a young lady who I had previously known, who was acting as my accompanist, it was past six o'clock. I have made it a practice never to touch food after lunch—at one o'clock—the night I lecture, I have found out that this is the best course for me, at any rate. I had a good hour's rest before dressing. At a quarter to eight I proceeded to the hall with my accompanist, and found hundreds of well-dressed people—men, women, and children—crushing at the door, eager to get in. I had only one man taking the money, as I had no idea that there would be such a crush. It was fully ten minutes before one could get in. The piano was placed behind the stage, so also was my choir, who were singing my choruses. This I found out afterwards was an error. I went to the back of the stage to see if my operator was all ready, as we had the sheet wet and were showing the pictures through—a very heavy order for an oil lamp. Punctually at eight I got the young lady started, and the sound from an ancient piano, instead of pleasing the audience, simply irritated them, and I could feel in a moment that this vast audience would not stand much of this. I went round to the young lady and asked her to stop at the end of the bar. I then went right on to the middle of the stage, and stood perfectly still. The people by this time had filled the body of the hall, and hundreds—principally young men—were standing at the back. I waited until a lady and gentleman, who had just come in, came forward to the reserved seats, and got seated, and said: "Ladies and gentlemen, as most of you are aware, I am not a professional lecturer, as I am, as you know, a coachbuilder. The success I have everywhere met with in this lecture, has encouraged me to come among you to-night. I would, therefore, ask your kind indulgence. To the children, I need not ask them to be quiet, as everything they will see and hear will be a revelation to them. To the young men especially, I would ask them not to be rowdy, as several of the pieces I will recite are of a deeply pathetic nature, and the slightest noise will spoil the effect."

I then gave a synopsis of my lecture, and wound up with a lively story of "How a heavy swell tried to take the rise out of a New Zealand lad (me), and lamentably failed." This took immensely, and I had the lights turned down and sailed in; and for two hours without a break I had the most orderly and well-behaved audience I ever spoke to. I had given this lecture nearly 100 times, but my operator, who ought to know, said that I completely surpassed myself that night. As I was leaving the stage an old man came up, and warmly grasping my hand, said "He was delighted. I have ridden thirty-two miles my boy to hear you, and if you will play to-morrow night I will come back again." This, of course, was out of the question, as I was billed further on. This ended happily, what I felt was the most critical audience that I had ever spoken to.

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A Chat About Fog.

By Duncan Moore.

Fog of one kind or another has been the bugbear of photographers from the discovery of photography up to the present time. It may be roughly classed under three denominations, namely:—Chemical, light, and that of doubtful origin. Chemical fog may, or may not, be under the control of the operator. Not when it is engendered during the preparation of the emulsion or plates, either by over-emulsifying, the too long continued action of heat, the use of impure or unsuitable materials, the injudicious use of ammonia, general carelessness in preparation, and the action of light during or before the time, the plates are packed in their light-tight cases. There are other reasons for fog in the manufacture of plates not readily ascertained, but providing all well-known precautions are observed, as is usually the case with manufacturers of repute, any case of fog can be traced to its source; as a rule it is found to proceed from some oversight or other. The necessary precautions to ensure perfection are now so well-known, that it is rarely foggy plates are sent out, unless by some accidental slip.

Plates that may be perfection, soon after being made, for some reason or another rapidly deteriorate by keeping, no matter how carefully. This applies to most very rapid plates. Why fog should be engendered by keeping a comparatively short time is not so evident when due precautions have been taken in storage, but there is no disputing the fact. The probability is, the change has been going on from when they were first made—possibly they may not have been sufficiently dried before packing. Old-fashioned dry-plates, such as the "Liverpool Dry-plates," judged by our present standard of rapidity were very slow, but they kept without the slightest deterioration for an unlimited time. I have tried them after keeping twenty years, without detecting the slightest falling off in any way, or the least suspicion of fog. That gelatine exercises a deleterious influence on the haloid salts of silver is possible, and the method adopted to enhance the rapidity of the films starts the fogging action, which seems to be a continuation of the increase of sensitiveness until it gets beyond control, like a runaway horse having taken the bit in its teeth. This idea is supported by the fact that slow plates are seldom foggy, and keep very much better than rapid ones. Lantern plates, with which we have so much to do, are of the very slow order, and work perfectly free from fog, a *sine qua non* for the production of a brilliant image, for it has been found that rapid plates will not work with the clearness required for either lantern or photo-mechanical work, or bear prolonged development without veiling. The greater number of photographers purchase their plates already prepared, and are consequently at the mercy of the makers, to the credit of whom it must be said, as a rule, supply their customers with excellent and reliable goods.

When fog supervenes, it is more often than not attributable to the worker, and not to the plates. Should there be any doubt as to the integrity of a batch of plates, let one be taken as a sample from the package and in total darkness placed in a dish and developed for twenty minutes with a normal developer to which one is accustomed, or one recommended by the makers, without exposure to light of any kind. When fixed, the plate should come out perfectly clear and fogless, proving that there is no fault of the nature of fog in the plates, and any subsequent development of it must be searched for during the manipulations. If a plate is fogged by improper treatment, the margin protected by the rebate of the dark slides, that should be clear glass, will be evenly fogged all over, but, if by over-exposures, the margins will only show a fog on those portions adjoining to high lights, such as the sky, and where deep shadows occur near the edges of the subject, otherwise the margin will remain clear, unless the exposure has been so excessively overdone that the light has had time to affect the whole of the surface. This dictum is in some measures qualified by the rapidity of the plate, and the quality of the emulsion, but will hold good in the greater number of cases.

The lateral dispersion of light in the film and its support gives rise to much trouble by rendering the image much less clear than it should be, but it is, however, somewhat different to the effect of fog, although it may sometimes be confounded with it, and is particularly evident when the subject photographed consists of sharp contrasts of bright lights and deep shadows. Therefore, every means possible should be used to counteract this by backing the plates with black varnish or some non-actinic colour, and the choice of a make of plates as little liable to it as possible, for in this respect many otherwise excellent plates are defective. When the margin of the negative is fogged, where protected from direct light, it is safe to assume that the shadows of the subject itself are less clear than they ought to be, although, owing to the gradations of light and shadow, it may escape observation.

A cause of fog is frequently owing to the use of a lens that will cover a much larger plate than the one being used, without the precaution being taken of a black screen in the camera to limit the area of light, which otherwise is thrown on the sides of the camera, and from thence reflected on to the plate; the amount of light so reflected may not be much, still it is quite sufficient to interfere with brilliance of result. Even with wet collodion the use of a screen considerably brightens up the image, and with the far more sensitive gelatine plate the improvement is in a much greater degree. The reflections from the inside of the lens mount when the light is allowed to fall upon it other than that necessary for forming the image is a fertile source of fog. A large funnel-shaped hood, projecting from the front of the camera well over the lens, will be a vast improvement, taking care that it does not cut off any of the image, but the nearer it comes to it the better, as all light in the camera not required to form the image is a detriment, and not an assistance. Light fog, in contradistinction to chemical fog, is the impact of any actinic light on the plate not used for the production of the image, such as the use of an unsafe illuminant in the dark room, imperfect dark slide, or, what is a very common practice, allowing a full strong light to fall on the camera or dark slides when charged, without any protection, except the woodwork, etc., of the apparatus itself, which is, in bright, sunny weather, quite an inadequate safeguard to, at any rate, very sensitive plates. All dark slides should be kept in bags of opaque material, and a good focusing cloth thrown over the camera when working out of doors or under a good sky light. The wonder is that fog is not induced much oftener than it is when slides and camera are allowed to be exposed for hours to a blazing sunshine as they frequently are without any extra protection.

(*To be continued*).

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Contact and Reduction.

By T. Perkins.

I suppose the majority of lantern slides made by amateurs are made by contact. There are many reasons for this. A quarter-plate camera is easy to carry, quarter-plates are less expensive than those of larger size, and when a quarter-plate negative has been made it seems so much easier to put it into a printing frame with a lantern plate in contact with it, than to use a reducing camera. Moreover, there are many lanternists who are occupied in business during that part of the day when sunlight is available for making slides in the camera, and who prefer to spend their weekly half-holiday, or the longer holiday that comes once or twice a year, in going out to get fresh negatives, rather than in making slides from old ones, and who therefore have to make use of artificial light for slide making. To make a slide in the camera with nothing beyond the ordinary paraffin lamp or gas burner is a slow process, and stronger light is not in all cases easy to obtain, whereas the contact method is easy and rapid, hence it is frequently adopted.

At one time I thought that better slides from a technical point of view could be obtained by reduction, and no doubt in some cases this is so, as if either plate is not absolutely flat perfect contact cannot be obtained, and want of sharpness here and there will be the result, but further experience has shown me, provided both plates are flat and care is taken, that in most instances there will be little difference as far as technical excellence is concerned whichever of the two methods is employed; but it is not so, as far as regards artistic effect, unless when the small negative is composed on the ground glass, the lantern slide is looked forward to as the ultimate object in view. It is impossible to get a quarter-plate negative that will give an artistic print of anything like the full size of the plate, and also a good contact lantern slide. The method usually adopted is to take a quarter-plate negative with a view to making a paper print from it, and then to print a 3¼ inch square from some part of it on a lantern plate.

Now let us see to what this leads. First, in any case, to a square picture, a shape that a painter rarely, if ever, adopts. Probably when this square picture measuring 2¾ or 3 inches each way is put in the lantern, it is found that the corners are not illuminated, for the ordinary 4 inch condensers are not large enough to illuminate a square of this size. Hence, a circular, or at any rate a cushion-shaped mask is used. The former shape is rarely suitable to a picture; the latter is most objectionable. It is, I believe, one that never will be found in any exhibition of paintings, and very rarely in any exhibition of photographic prints. But this is not all; if the lantern plate is put nearer to one end of the negative than the other, the perspective suffers, for the point of sight to which all parallel lines at right angles to the plane of the picture converge, is, if the camera has been rightly used, equally distant from each end of the negative; but if the lantern plate is not placed centrally on the negative, the point of sight will be thrown either to the right or left hand side of the transparency, the result of which, in some cases, would be most unpleasant to any educated eye when the picture is thrown on the screen. But even if the lantern plate is correctly placed, the composition of the picture must suffer from the loss of half an inch from either end of the subject included in the negative, if it was originally composed with a view to a 4 by 3 inch print. I think if the possessor of a quarter-plate camera wishes to make his slides by contact, the best thing he can do is to cut for each back he has, two slips of wood $\frac{15}{16}$ inch wide, 3¼ inches long, and of such a thickness as will lie in the double dark back when closed. If one of these is placed at either end of the back, it will leave a space of 3¼ by 2⅜ inches between them for the insertion of a plate. This size is exactly one quarter of a half-plate, and, of course, of the same shape—a shape which I believe is the ideal one for a picture, although the subject will often compel some deviation from it. The cheapest way of getting plates of this size will be to invest in a glazier's diamond, and cut up half-plates into four equal parts. The cost of the diamond will soon be saved, as the cost for a dozen negative plates will only be 6¾d., instead of 1s., as it would be if quarter-plates were used. When the plates are inserted in the backs, in the manner recommended, we shall get a vertical view with the reversing back of the camera arranged as if for a horizontal view if a quarter-plate were being used, and *vice versa*. This must, of course, be remembered, and, indeed, cannot be forgotten if, as is most desirable, the ground glass has two strips of black paper, $\frac{15}{16}$ inch wide, pasted along each end, thus leaving a space of exactly the same size, and taking in exactly the same amount of subject as will be depicted on the plate when the exposure is made. By this means the picture can be easily composed on the screen.

(*To be continued.*)

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Topical Notes.

By The Dreamer.

Lantern evenings at our Society meeting have been somewhat at a discount lately, Röntgen ray experiments, or rather demonstrations, having to a certain extent taken their place.

There are some very fine Röntgen slides on the market now, and one or two included in a lantern entertainment would, no doubt, be interesting, but the well-known hand shadowgraph should be avoided. Snakes, mice, and birds are a little more uncommon.

A good method of making diagram slides is to use celluloid with a finely-ground surface, and make the drawing with a fine pen. In this way several different coloured inks can be used, which is often exceedingly useful. Besides, the drawing can be removed when done with, and the sheet of celluloid used again for another diagram.

A lantern does not deteriorate so much when in use as during the period of its non-use. When about to be placed away for a time the lenses should be gently dusted with a camel hair brush, the condenser removed from its cell and washed. All metal and wood parts should then be thoroughly cleaned and dusted, and, finally, wiped with an oily rag all over. The oil will form an excellent protective coating. Jets, saturators, dissolvers, regulators, and pressure gauges (no oil in the working parts of the last two, mind) should be examined and cleaned; then slides should be gone over and put in order. No doubt a few will require new cover glasses, some new slides will have to be made to replace broken or damaged ones, some will require fresh binding strips, and all will want a polish with a glass cloth.

During the spring and summer months busy brains will be at work devising improvements and novelties for the next lantern season. It is difficult to foretell in what direction the improvements will be. No doubt we shall have improved forms of jets, and probably one or two acetylene generators will be in evidence, should a good supply of calcium carbide be available.

Of portable single lanterns we have a great variety, many of them being very satisfactory instruments, but I think attention might be profitably directed to our bi-unial lantern. Perhaps, in many cases, it is necessary that it should present an ornamental appearance, but much could still be done to render it a less unwieldly and cumbersome instrument than it is at present, without lessening its stability and other good qualities.

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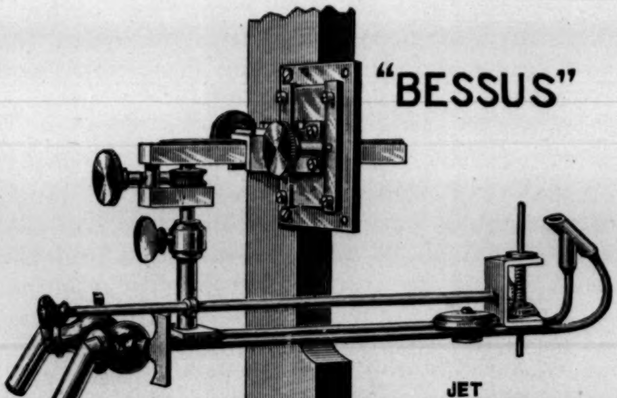
New Apparatus.

"BESSUS" JET CENTERER.

Messrs. Airs & Co., of 84, Hatton Garden, have made some modification in the centerer which they first brought out. As now made, it hangs from the rackwork as shown. The whole appliance can be obtained ready for screwing on the back of lantern, to which any commercial jet may be clamped. By means of the milled heads, the jet can be raised, lowered, brought to or from the condenser, and moved sideways, all from the back of the lantern. The great accuracy with which the light can be centered makes this appliance very useful in connection with microscopic projection.



Patent Intelligence.

The following list, relating to current Patent Applications, is compiled expressly for "The Optical Magic Lantern Journal" by a registered Patent Agent. For further information apply to The Patent Department, "Optical Magic Lantern Journal," 9, Carthusian Street, London, E.C.

No.	Recent Patent Applications.
5606.	12th March, 1896. Bouet (E. Rousseau). Improvements in or relating to burners for acetylene gas.
5976.	17th March, 1896. E. Appleby and H. F. Harris. An apparatus for automatically and safely generating and storing acetylene.
6245.	20th March, 1896. M. Freudenberg. A method of and apparatus for taking and viewing photographic pictures.
6294.	21st March, 1896. W. Hunt and T. Trotter. Improvements in kinographic and kinoscopic apparatus.
6503.	24th March, 1896. G. W. de Bedts. Improvements in the mechanism of chromo-photographic, kinetoscope and lantern projection apparatus.
6637.	26th March, 1896. A. E. Bingemann. Improvements in magic lantern slide carriers, whereby the slide is tinted or coloured during projection.
6731.	27th March, 1896. J. H. Rigg and E. Kumberg. Improvements in kinematographs, kinetographs, and like apparatus.
6739.	27th March, 1896. J. C. Bayley. Improvements in apparatus for generating and storing acetylene gas, especially suitable for use in portable installations.
7241.	2nd April, 1896. E. Smith. Improvements relating to magic lanterns and other projection apparatus.
7528.	9th April, 1896. B. Doyle. Improvement in combined cameras and optical lanterns.
7559.	9th April 1896. W. Hampson. Apparatus for separating mixed gases by refrigeration, especially applicable to the separation of oxygen from air.
7693.	11th April, 1896. P. Woog. Improvement in or relating to lamps and apparatus for the generation and combustion of acetylene gas.

Recently-printed Specifications.

Copies of the following specifications may be obtained by remitting 1/- for each specification to The Patent Department, "Optical Magic Lantern Journal," 9, Carthusian Street, London, E.C.

24766 of 1894. Millward. Cyclorama.
1116 of 1896. Rossbach-Rousset. Acetylene gas.

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Editorial Table.

Archer's Catalogue.—A neat, well-printed, and attractive catalogue has been issued by Messrs. Archer & Sons, 43 to 49, Lord Street, Liverpool. It commences with a short chapter "To the beginner in Photography," which contains some good hints. Complete outfits and cameras of all styles are to be found in this list; also particulars of about two dozen hand cameras of their own and other makes. Archer's lenses and condensers, which are highly spoken of by users, are dwelt upon in detail. Lanterns, though a strong point with this firm, are not treated on very fully in this photographic catalogue, as they issue one more fully devoted to this subject at the commencement of each season.

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Correspondence.

IS THE LANTERN "PLAYED OUT?"

To the Editor.

Sir,- It was a day or two after having a discussion with a friend upon this subject that I saw an announcement in a Saturday evening paper "Where to go tomorrow. St. Mary-at-Hill Church, E.C. Evensong, illustrated by dissolving views." Visions of men, with long noses, jumping clowns, kicking donkeys, etc., floated before my eyes, with a parson in the background delivering a sermon to an empty church, and full of wonder and bewilderment, I determined to pay a visit to the service.

Arriving at the door about 6 p.m., I found a crowd of people waiting for the doors to open, and while I wondered at the sight of a crowd outside a church, the doors opened, and we were carried in by the crush behind.

Inside an orchestra was playing, a cornet solo, and a lady singing a sacred piece, adding to my bewilderment, but the crowning piece was yet to come.

Presently the organ struck up, the brass and concertina bands, and the orchestra followed suit, the processional hymn being thrown upon a sheet suspended between two pillars in front of the altar. The service then followed, the whole of which was thrown upon the sheet. Pictures were then shown, illustrating the sermon which was to follow.

After the sermon, the lights were lowered, and more sacred pictures were shown, while a solo was exquisitely rendered by a lady. The service then concluding, I left, having spent a most enjoyable evening.

I heartily recommend any pessimistic lanternist who feels that the lantern is losing in public favour to attend one service, and see the crowds who flock to see the pictures, and hear the Rev. W. Carlile (founder of the Church Army) speak; it will simply act like a charm, and brace him up for the week's work more than anything else.

OBSERVER.

WHAT IS THE RATIONALE OF SLIDES CRACKING?

To the Editor.

Dear Sir,—Could any reader give me an explanation of the following circumstance? I was exhibiting with a safety jet with hard limes, Riley's Præstantia; I inserted a painted slide (carefully wiping it with wash leather before insertion), the slide was in the lantern about ten minutes, then it cracked, sometimes across and sometimes half-way (I had four slides cracked). The slides did not crack soon after I put them in, but after being in about ten minutes. The slides were not placed right against the condenser, but about 2½ inches from it. Why should they crack? If they had cracked soon after insertion, one would say it was the heat of the lantern.

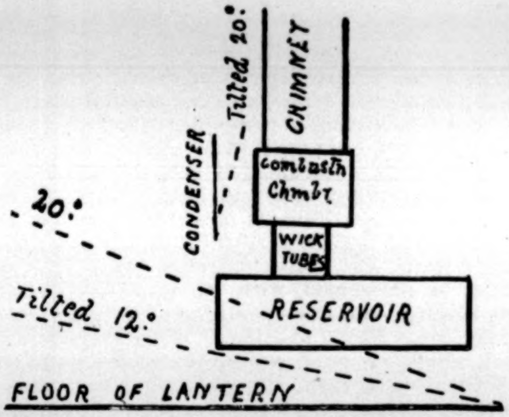
Yours truly,

Lytham. R. B. PRICE

TILTING OIL LAMPS.

To the Editor.

Dear Sir,—Your correspondent, the showman, in an article in April issue, must evidently have written some portion of it rather hastily. With regard to tilting, I can conveniently tilt my Patent Oil Lamp at an angle of 10 degrees without spilling the oil, and if the reservoir is made still deeper I could conveniently tilt it 20 degrees; the flames in either case have no inclination to strike the glass plates. Showman's idea of the gudgeons is decidedly wrong. You will see by rough sketch that if the lantern is tilted to an angle of 20 degrees the condenser cannot advantageously collect the light, not even if the lamp gudgeons are made to raise or lower. Why cannot users of oil lit lanterns use long focus objectives, providing suitable condensers are used, and the objectives are made sufficiently large to collect all the light?



Yours truly,

W. STOCKS.

Rye, Sussex.

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ANCIENT WATER AND FLOUR MILLS.

To the Editor.

Dear Sir,—In your issue for April I notice an enquiry by R. Bennett as to the whereabouts of old wind flour mills. I am pleased to say I can tell him of several. At East Retford, Notts, he will find two, one a four sail and the other a six sail mill; at Sutton, 3 miles distant, a four sail mill; at Clareborough, a dilapidated post mill, 3½ miles from Retford, on Clareborough Hill; at Tuxford, 6½ miles from Retford, two four sail mills; at Market Rasen, about 13 miles from Lincoln, he will find such an one as is very rarely seen now, viz., an eight sail mill - it is just outside the station. There are several more four sail mills round about Retford, but they are all of the same type. Hoping these will be of use to him.

I am. sir, yours truly,

278, Pitsmoor Road,
Sheffield. T. E. MORGAN,

To the Editor.

Dear Sir,—Mr. R. Bennett asks for photos of mills, see page 74, last issue of journal. I can offer him three or four good negatives.

Yours faithfully,

C. W. LOCKE.

224, Tottenham Court-road, W.C.

To the Editor.

DEAR SIR,—There are several flour wind mills in this locality; one at Sandhurst (about 15 miles from here) has five sweeps. There is a water mill at Bodiam. If Mr. Bennett pays a visit to Rye this summer, I will willingly give him all the information I can respecting their whereabouts, &c.

Yours truly,
W. STOCKS.

Rye, Sussex.

To the Editor.

SIR, — Your Liverpool correspondent who in this month's journal asks for information about ancient water and flour mills existing in various parts of the country, may be interested to know that in Orkney and Shetland he will find, still in use, mills of the most primitive construction for grinding oats and bear. They are locally termed clack mills. There is one in the parish of Birsay in Orkney. The building is quite small, not above 18 feet by 10 feet. The water wheel, about 4 or 5 feet in diameter, is horizontal, with an iron spindle which, passing through the lower millstone, is firmly fixed in the upper one. From the upper stone projects a piece of wood, which on such revolution of the stone strikes the "feeder," and from the clacking sound thus produced these mills acquired their name. I have not been able to procure a photograph of any of these mills, or I would willingly have sent one for insertion in your correspondent's "History of British Corn Mills."

I am, etc.,
AN OLD PHOTOGRAPHER.

Orkney, April, 1896.

——:o:——

Notes and Queries.

D. J. Lewis.—The quantity of gas mentioned may last out the time with care, and if you use a screw-down valve instead of the automatic regulator you will be able to get practically all the gas from the cylinder.

R.N.—To remove the film of negative from the glass support, leave it to soak in a dilute solution of hydrochloric or nitric acid, and assist with a little manipulation.

C. writes:—Can you tell me if the Hill-Norris lantern plates are still made? I have been informed that the Hill Company is not now in existence. *Reply.*—The Birmingham Dry Plate Company, of Yardley, Birmingham, used to make these plates, but we understand the firm ceased to exist more than a year ago; but a new company (the Hill-Norris Plate Company), has taken the business over, and they can again be obtained from most dealers. Try Whittingham & Co., 91, Gracechurch Street, as this is a few doors from your address.

J. P. Lewis.—Use one half of the condenser, keeping the convex side next to the stage which you are illuminating, and adjust the distance of jet from condenser until the desired area is covered with light.

T. A. L.—See illustrated article in this issue. Please note that we have removed our offices to 9, Carthusian Street, E.C.

T. W. Hughes.—Mr. Wilkie's series of articles on "Optical Illusions" will be found in this journal for September, October, November, and December, 1894, and January, February, March, and April, 1895.

H. Tower.—Since you purchased the cylinder, compressers have resorted to a higher standard of test, and although yours stood it a few years ago, it it evident that it will not the present test. Many cylinders were thus rendered practically useless, and the makers wishing to meet the holders, offered to supply an up-to-date one at reduced price.

P. J. Lehman.—(1, 2) We have never used a tank similar to that to which you allude. (3) The diameter of tube can be the same. (4) Yes, by making it taller. (5) Mr. Blaker, Boro' Studio, Worthing. (6) We should think that Mr. Stedman's apparatus described in this issue is just the thing you want. (See his advertisement.)

H. J. Walker.—See article in this journal for December last. There is very little pressure. Flannel and tin will do, and shape is a mere matter of taste. Thanks for suggestion; will use it shortly.

P. S. writes:—Several people appear to be the inventors of what is called living photographs projected on the screen. I have been told of four. . . . Surely they cannot all have invented it. Which one is the inventor? *Ans.*—Neither of those you mention. The inventor is Mr. Friese Green, and in this journal for November, 1889 and April, 1890, you will find the first information on this subject that was ever published. The parties you mention have brought out modified apparatus for projecting the pictures, and that is all.

G. H. Philip.—(1) *Re* Bude light. This consists of two or three concentric Argand burners, into which is introduced a stream of oxygen. (2) Zirconia can hardly be said to be generally used for the purpose, but there are a few who use it principally for microscopic work.

Achromatic.—(1) The larger diameter will have the advantage. (2) In very long focus lenses there is practically no advantage.

Volume.—We can supply back numbers at usual price, plus postage.

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THE LANTERN SOCIETY.—A few weeks ago Mr. W. Lamond Howie, F.C.S., lectured before the Lantern Society, his subject being what he called "The Scottish Alps." This, and the preceding demonstration of the new photography by Mr. Snowdon Ward, together with that of Mr. Freshwater, have been the successes of the season; the interest excited was keen and sustained, the audience crowding the meeting-room at 20, Hanover Square, to its fullest capacity. The glen, river, loch, and mountain scenery of the western highlands were illustrated by about 150 slides of the highest photographic merit. The spring snows on Ben Nevis and other hills appeared on the screen with quite a startling fidelity to nature; peaks scared, precipices frowned, lakes mirrored their surrounding beauties, and over all were some wonderful effects of cloud and broken sunshine. The figure subjects were full of human nature—Highland lassies—peat gatherers, fisher folk, and cottagers—old smugglers, illicit still keepers and deer stalkers—introduced to the audience in Mr. Howie's own graphic and humorous style, increased the popular interest of the evening. The electric light, just presented to the society by its chairman, Mr. Vezey, was used in the lantern with the best results. On the 27th ult., Mr. T. E. Freshwater, F.R.M.S., F.R.P.S., gave a popular lecture on stereoscopic projection, using appliances similar to those described on page 21 of the OPTICAL MAGIC LANTERN JOURNAL for February. In addition to this Mr. Freshwater gave an entertaining talk, "Among the bees with a camera," illustrating same with a choice selection of photographic lantern slides.